

## CLAIMS

What is claimed is:

1 1. A method of lapping an air bearing surface to provide  
2 a desired surface dimension, comprising:

3 (a) providing a non-abrasive lapping plate with a  
4 plurality of grooves, and a magnetic transducer having an  
5 air bearing surface with electrical components embedded  
6 therein;

(b) supporting the magnetic transducer such that the  
air bearing surface is exposed;

(c) dispensing a non-abrasive liquid between the air  
bearing surface and the lapping plate; and

(d) contacting the air bearing surface with the  
lapping plate such that the air bearing surface is lapped  
solely by the grooves in the lapping plate, and wherein the  
electrical components are lapped such that they are  
substantially uniform in dimension relative to the air  
bearing surface.

1 2. The method of claim 1 wherein step (d) comprises  
2 rotating the lapping plate relative to the air bearing  
3 surface.

1 3. The method of claim 1 wherein step (a) comprises  
2 forming the grooves in the lapping plate in configurations  
3 of pericycloids, epicycloids, hypocycloids, and circles.

1 4. The method of claim 1, further comprising the step of  
2 interrupting a planarity of a lapping surface of the  
3 lapping plate with the grooves in the lapping plate surface  
4 such that a high percentage of lapping surface engagement  
5 is provided by the grooves to reduce a hydrodynamic film  
6 from the liquid.

5. The method of claim 1 wherein step (a) comprises  
providing the grooves in approximately 0 to 5 % of a  
surface of the lapping plate.

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1 6. A lapping plate for lapping a workpiece having an air  
2 bearing surface with electrical components embedded therein  
3 to provide a desired surface dimension thereof, comprising:

4 a non-abrasive lapping plate having a lapping surface  
5 with a plurality of grooves therein, wherein when a non-  
6 abrasive liquid is dispensed between an air bearing surface  
7 of a workpiece and the lapping plate, the lapping plate  
8 contacts the air bearing surface such that the air bearing  
9 surface is lapped solely by the grooves in the lapping  
10 plate, and wherein electrical components embedded within  
11 the air bearing surface are lapped such that they are  
12 substantially uniform in dimension relative to the air  
13 bearing surface.

14 7. The lapping plate of claim 6 wherein the grooves in  
15 the lapping plate are in configurations of pericycloids,  
16 epicycloids, hypocycloids, and circles.

17 8. The lapping plate of claim 6 wherein a planarity of  
18 the lapping surface of the lapping plate is interrupted  
19 with the grooves such that a high percentage of lapping  
20 surface engagement is provided by the grooves to reduce a  
21 hydrodynamic film from the liquid.

22 9. The lapping plate of claim 6 wherein the grooves  
23 comprise approximately 0 to 5 % of the lapping surface of  
24 the lapping plate.

1 10. A system for lapping a workpiece having an air bearing  
2 surface with electrical components embedded therein to  
3 provide a desired surface dimension thereof, comprising:

4 a non-abrasive lapping plate having a lapping surface  
5 with a plurality of grooves therein;

6 (a support structure) for supporting a workpiece such  
7 that an air bearing surface thereof is exposed;

8 a non-abrasive liquid; and wherein

9 when the non-abrasive liquid is dispensed between the  
10 air bearing surface and the lapping plate, the lapping  
11 plate contacts the air bearing surface such that the air  
12 bearing surface is lapped solely by the grooves in the  
13 lapping plate, and wherein the electrical components of the  
14 air bearing surface are lapped such that they are  
15 substantially uniform in dimension relative to the air  
16 bearing surface.

17 11. The system of claim 10 wherein the grooves in the  
18 lapping plate are in configurations of pericycloids,  
19 epicycloids, hypocycloids, and circles.

20 12. The system of claim 10 wherein a planarity of the  
21 lapping surface of the lapping plate is interrupted with  
22 the grooves such that a high percentage of lapping surface  
23 engagement is provided by the grooves to reduce a  
24 hydrodynamic film from the liquid.  
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1 13. The system of claim 10 wherein the grooves comprise  
2 approximately 0 to 5 % of the lapping surface of the  
3 lapping plate.

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